

What is claimed is:

1. A process for isomerizing pentenenitrile in a reactant stream, wherein the isomerization takes place over at least one catalyst dissolved homogeneously in the reactant stream.  
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2. The process according to claim 1, wherein cis-2-pentenenitrile is isomerized to trans-3-pentenenitrile.
- 10 3. The process according to claim 1 or 2, which is carried out in an apparatus connection comprising at least one reactor and at least one distillation apparatus, the reactors, if more than one reactor is used, being connected directly in series, and the distillation apparatuses, if more than one distillation apparatus is used, being connected directly in series, and the at least one distillation apparatus being connected downstream of the at least one reactor.  
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4. The process according to claim 1 or 2, which is carried out in more than one apparatus connection, the individual apparatus connections being connected in series and the individual apparatus connections comprising at least one reactor and at least one distillation apparatus, the reactors of the individual apparatus connections, if more than one reactor is used in the apparatus connection, being connected directly in series, and the distillation apparatuses of the individual apparatus connections, if more than one distillation apparatus is used in the particular apparatus connection, being connected directly in series, and the at least one distillation apparatus being connected downstream of the at least one reactor in the particular apparatus connection.  
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5. The process according to claim 1 or 2, wherein the isomerization is carried out in a distillation column.  
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- 30 6. The process according to any of claims 1 to 5, wherein the isomerization is carried out in the presence of an ionic liquid as the homogeneously dissolved catalyst, and the ionic liquid is selected from a group consisting of Brønsted acid adducts of organic nitrogen-containing substances.
- 35 7. The process according to any of claims 1 to 5, wherein the homogeneously dissolved catalyst used is a C1- to C20-mono- or -diamine.
8. The process according to any of claims 1 to 7, wherein the reactant stream comprises further components selected from a group consisting of C5-mononitriles, C6-dinitriles, aliphatic C1- to C16-alkanes, cyclic C1-  
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C16-alkanes, aliphatic C1- to C16-alkenes, cyclic C1- to C16-alkenes.

9. The process according to any of claims 1 to 8, wherein the reactant stream stems of a process for hydrocyanating 3-pentenenitrile.

Isomerization of cis-2-pentenenitrile to 3-pentenenitrile in a reactive distillation

Abstract

5 A process is described for isomerizing pentenenitrile in a reactant stream, wherein the isomerization is effected over a homogeneously dissolved catalyst.

What is claimed is:

1. A process for isomerizing pentenenitrile in a reactant stream, wherein the isomerization of cis-2-pentenenitrile to trans-3-pentenenitrile takes place over at 5 least one catalyst which is dissolved homogeneously in the reactant stream and is a C<sub>1</sub>-to C<sub>20</sub>-mono- or -diamine or an ionic liquid, the ionic liquid being selected from the group consisting of Brønsted acid adducts of organic nitrogen-containing substances.
- 10 2. The process according to claim 1, which is carried out in an apparatus connection comprising at least one reactor and at least one distillation apparatus, the reactors, if more than one reactor is used, being connected directly in series, and the distillation apparatuses, if more than one distillation apparatus is used, being connected directly in series, and the at least one distillation apparatus being 15 connected downstream of the at least one reactor.
- 20 3. The process according to claim 1, which is carried out in more than one apparatus connection, the individual apparatus connections being connected in series and the individual apparatus connections comprising at least one reactor and at least one distillation apparatus, the reactors of the individual apparatus connections, if more than one reactor is used in the apparatus connection, being connected directly in series, and the distillation apparatuses of the individual apparatus connections, if more than one distillation apparatus is used in the particular apparatus connection, being connected directly in series, and the at 25 least one distillation apparatus being connected downstream of the at least one reactor in the particular apparatus connection.
4. The process according to claim 1, wherein the isomerization is carried out in a distillation column.
- 30 5. The process according to any of claims 1 to 4, wherein the reactant stream comprises further components selected from a group consisting of C5-mononitriles, C6-dinitriles, aliphatic C1- to C16-alkanes, cyclic C1- to C16-alkanes, aliphatic C1- to C16-alkenes, cyclic C1- to C16-alkenes.
- 35 6. The process according to any of claims 1 to 5, wherein the reactant stream stems of a process for hydrocyanating 3-pentenenitrile.